REMARKS

Claim 2 has been amended to add functional language as discussed with the Examiners during an interview on September 14, 2005. The substance of the interview is believed adequately set forth in the interview summary prepared by the Examiners at the end of the interview.

The amendment to claim 2 and the remarks are in response to the final Office Action dated June 15, 2005.

Specification

The specification has been amended to correct certain additional minor informalities noted by the Applicants. No new matter has been added by the amendments to the specification.

Allowable Subject Matter

Claims 10, 11 and 12 stand allowed. By this amendment, however, the Applicants made a minor amendment to claim 11 to improve its form by deleting the duplicative recitation of "magnetoresistive head".

Claim Rejections under 35 U.S.C. §103

Claims 2, 5, 8, 14 and 17 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Akio, JP 11-265503 in view of Sato, U.S. Patent 6,477,006. Of these claims, claim 2 is the only independent claim. By this amendment, claim 2 has been amended in accordance with the interview with the Examiners and is believed patentable for the reasons set forth hereafter.

Patentability of the Claims

Claim 2 is directed to a magnetoresistive head used for reproducing sound. Claim 2 recites a magnetoresistive head having the following construction:

1) A magnetoresistive layer which converts magnetic signals to electric signals,
2) A pair of electrodes for allowing an electrically sensing current to flow across the magnetoresistive layer,

3) Upper and under gap layers placed over and beneath the pair of electrodes and the magnetoresistive layer,

4) Upper and under shield layers, one of which is placed over the upper gap layer and the other is placed beneath the under gap layer.

Claim 2 further defines that at least either of the upper and under gap layers is made of the varistor material so that electrostatic breakdown of the magnetoresistive layer is prevented. The latter functional language has been added to further define Applicants' invention in that it describes the function of the varistor gap layer.

In the rejection of claims 2, 5, 8, 14 and 17 the Examiner stated that Akio discloses all the elements of claim 2 except for teaching or suggesting that either of the upper or under gap layers are made of varistor material. To provide this teaching lacking in Akio, the Examiner cited Sato as disclosing the use of SiC as a gap layer material and that SiC is silicon carbide which is known as a varistor material. It was the Examiner's opinion that it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the upper and lower gap layers of Akio out of SiC as taught by Sato in view of the statement in Sato at column 9, lines 48-53 that the gap layer can be formed by sputtering or ion beam sputtering process which is superior to an electroplating process in reproducibility and uniformity of the resulting film.

As discussed during the interview, Applicants do not believe this statement in Sato would make it obvious to make either of the upper and lower gap layers of Akio out of SiC.

The gap disclosed by Sato, which is related to a recording head generating a recording magnetic field, is gap 45 formed between upper magnetic pole layer 46 and lower magnetic pole 44. Because there is a gap between the upper magnetic pole layer and the lower magnetic pole layer of Sato, a fringing magnetic field is generated and by this fringing magnetic field, information is recorded on the magnetic recording medium.

The gap disclosed by Akio, which is related to a reproducing head detecting magnetic field, is gap layer 15 formed between upper shield layer 11 and lower shield layer 10 at MR element 12. Upper shield layer 11 and lower shield layer 10 of Akio function to avoid any effect from a neighbor bit to the recording bit on the recording medium intended to be read out. These shield layers do not in any way generate the fringing magnetic field.

Thus, gap layer 15 of Akio is not for generating a fringing magnetic field. The shield layers 11 and 10 function as insulating layers which prevent electric short circuits from forming between the upper shield layer and the lower shield layer 10. Sato's gap used in a recording head is quite different from Akio's gap used in a reproducing head. Indeed, the structures and principles in a head for reproducing and a head for recording are quite different and one of ordinary skill in the art would not be lead to combine the teachings of these two references in the manner done so by the Examiner.

Claim 2 has been amended to clearly recite that either of the upper and under gap layers is made of varistor material so that electrostatic breakdown of the magnetoresistive layer is prevented. The breakdown of the magnetoresistive layer is the problem the present invention is intended to solve and only occurs in reproducing. This problem is not disclosed or suggested in any manner in Sato or in the combination of Sato and Akio.

It is therefore submitted that claim 2, as amended, patentably distinguishes over the prior art taken either alone or in combination.

Since claims 5, 8, 14 and 17 depend from claim 2, these claims are believed to be patentable for the same reasons advanced with respect to claim 2 as well as for the additional subject matter claimed therein.

Conclusion

In view of the foregoing amendments and remarks, Applicants contend that the above-identified application is now in condition for allowance. Accordingly, issuance of a Notice of Allowance is requested.

Respectfully submitted,

Gene W. Stockman
Registration No. 21,021
Attorney for Applicants

MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C.
1800 Diagonal Rd., Suite 370
Alexandria, Virginia 22314
(703) 684-1120
Date: October 17, 2005